

Infantile cerebral palsy and dental anomalies

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ABSTRACT

The term cerebral palsy has been around for more than a century, and the disease itself has probably existed without a name throughout human history. However, despite its long history, there is still no unity in views on this issue.

I. Introduction

Along with the generic term cerebral palsy, the term Little's disease is sometimes used in clinical practice. This name was proposed in honor of the British orthopedic surgeon William John Little, who in the mid-NINETEENTH century was the first to establish a causal relationship between complications during childbirth and impaired mental and physical development of children after birth [25]. His views were summed up in the article "on the influence of pathological and difficult childbirth, prematurity and asphyxia of newborns on the mental and physical condition of children, especially with regard to deformities. Such motor disorders were called Little's disease until the Canadian physician William Osler suggested using the term "cerebral palsy" in 1889. In the extensive monograph "Cerebral palsy in children", he also noted the connection between difficult childbirth and nervous system disorders in children. Infantile cerebral palsy as a separate nosological form that combines a variety of motor disorders of cerebral origin was first identified by the famous Viennese neurologist, psychiatrist and psychologist Sigmund Freud. In all previous publications of the nineteenth century on motor disorders in children, the term "cerebral palsy" was used only in combination with other terms (for example, "cerebral paralysis"). Nevertheless, the daily clinical practice of the second half of the XIX century needed to specify the terminology. In his monograph, Freud writes that the term "infantile cerebral palsy" combines "those pathological conditions that have long been known, and in which the paralysis is dominated by muscle rigidity or spontaneous muscle twitching."

Freud's classification and interpretation of cerebral palsy was broader than the subsequent formulations of other authors. He suggested using the term even in cases of complete absence of paralysis, such as epilepsy or mental retardation. This interpretation of cerebral palsy is much closer to the concept of early "brain damage", formulated much later. Perhaps Freud proposed to combine different motor disorders in children into one nosological group because He could not find another way to organize this area of pediatric neurology.

In the twentieth century, the lack of consensus on the definition of nosology made it difficult to conduct scientific research. It became more and more obvious for specialists to form a common view of cerebral palsy. Some researchers interpreted cerebral palsy as a single clinical nosology, others-as a list of similar syndromes.

Leading specialist on the problem of cerebral palsy, head of the largest center for the treatment of patients with cerebral palsy in Moscow, prof K. A. Semenova cerebral palsy unites a group of different clinical manifestations of syndromes that occur as a result of brain underdevelopment and damage at various stages of ontogenesis and are characterized by the inability to maintain a normal posture and perform arbitrary movements.

The definition of cerebral palsy proposed by academician Levon Badalyan was consonant. In his opinion, the term "cerebral palsy" combines a group of syndromes that occurred as a result of underdevelopment or brain damage in the prenatal, intranatal and early postnatal period. Brain damage is manifested by a violation of muscle tone and coordination of movements, the inability to maintain a normal posture and perform arbitrary movements. Motor disorders are often combined with sensory disorders, delayed speech and mental development, and convulsions.

An important milestone in the development of views on cerebral palsy was the holding of an International seminar on the definition and classification of cerebral palsy in July 2004 in Maryland [USA]. The workshop participants confirmed the importance of this nosological form and emphasized that cerebral palsy is not an etiological diagnosis, but a clinical descriptive term. The results of the workshop were published in the article "Proposal for the definition and classification of cerebral palsy". The authors proposed the following definition: "The term cerebral palsy [CP] refers to a group of disorders of movement and body position that cause activity restrictions that are caused by non-progressive damage to the developing brain of the fetus or child. Motor disorders in cerebral palsy are often accompanied by defects in sensitivity, cognitive and communication functions, perception, and/or behavioral and / or convulsive disorders."

The problem of cerebral palsy is one of the most urgent

problems of medicine. The social significance of this problem is so great that it is quite natural that there is an increasing interest in it. Cerebral palsy is a complex disease of the Central nervous system that leads not only to motor disorders, but also causes a delay or pathology of mental development, speech insufficiency, hearing and vision disorders. The severity of disability in 20-35% of patients is so significant that they do not serve themselves, do not

move, are not trained. The importance of this problem is determined by the increasing prevalence and social significance of the disease, which leads to severe disability.

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we were engaged in organizing medical care for these children, since most of them were considered unpromising for therapy, and in this regard, specialized institutions were not created for their treatment, and qualified specialists were not trained. Children with cerebral palsy were sent almost untreated to social welfare institutions. And only in the last 10-15 years, after effective treatment methods were developed, the attitude towards these children has changed. Recent observations have shown that comprehensive, systematic treatment can significantly reduce the degree of disability of a child or even eliminate it altogether. For many years, the health authorities did not actually organize medical care for these children, since most of them were considered unpromising for therapy, and therefore specialized institutions were not created for their treatment, and qualified specialists were not trained. Children with cerebral palsy were sent almost untreated to social welfare institutions. And only in the last 10-15 years, after effective treatment methods were developed, the attitude towards these children has changed. Recent observations have shown that comprehensive, systematic treatment can significantly reduce the degree of disability of a child or even eliminate it altogether.

In cerebral palsy, damage to the motor and other centers of the brain is reflected in the activity of the muscles of the limbs, head, neck or trunk. The severity of symptoms depends on the prevalence of brain damage and ranges from mild, barely noticeable to extremely severe, leading to complete disability. The disease is not inherited and is not a direct cause of death, but contributes to a decrease in life expectancy. There is no specific therapy. Conditions close to cerebral palsy can occur at any age after an infectious disease or traumatic brain injury. Cerebral palsy is usually caused by a lesion or injury to the brain before, during, or immediately after delivery. In many cases, the true cause remains unknown. Prenatal [prenatal] causes include infections during pregnancy, preeclampsia [late pregnancy toxicosis], and maternal-fetal RH-factor incompatibility. Other, and frequent causes of cerebral palsy are premature birth, asphyxia of the newborn and birth trauma. With a very low weight of the newborn, the probability of disease increases significantly.

There are several classifications of cerebral palsy. The classification of K. A. Semyonova of 1974 is used. In 2000, Cannes adopted a new international classification of cerebral palsy.

The classification of cerebral palsy is based on the nature of motor disorders and their prevalence. There are five types of motor disorders: 1) spasticity – increased muscle tone, the severity of which decreases with repeated movements; 2) athetosis – constant involuntary movements; 3) rigidity – dense, tense muscles that provide constant resistance to passive movements; 4) ataxia – imbalance with frequent falls; 5) tremor (tremor) of the limbs. Approximately 85% of cases have spastic or athetoid disorders. According to the localization of symptoms, there are four forms: 1) monoplegic (involving one limb), 2) hemiplegic (with partial or complete involvement of both limbs on one side of the body), 3) diplegic (involving either both upper or both lower limbs), 4) quadriplegic (with partial or complete involvement of all four limbs).

All forms are characterized by motor disorders of a reflex nature. Movements are possible, but they are not controlled by the child: there are compensatory movements and a vicious motor stereotype, coordination is impaired, and muscle tone is increased.

Cerebral palsy does not progress. As the child grows and develops, there may be a decrease in clinical symptoms of the disease. During all forms of cerebral palsy, there are 4 periods of recovery of the motor sphere and social orientation of the sick child. 1. Acute period lasting 7-14 days. There is a progressive course of the disease, expressed motor disorders, in some cases-the presence of periodic convulsive attacks. The 2-3-recovery period (early-up to 2 months, late-up to 1-2 years) is characterized by a pronounced early tonic reflex, which persists longer than normal, restraining the appearance of installation reflexes and the development of movements. Innate reflexes are affected or absent. 4. the period of residual phenomena begins with 2 years of age and continues in childhood and youth, and in severe forms-for life. The quality of recovery measures in this period depends on the previous systematic treatment. The lack of early treatment causes the formation of vicious postures and movements, making it difficult to normalize.

Elimination of the consequences of cerebral palsy is due to its social significance. This complex disease of the Central nervous system [CNS] occurs in the process of intrauterine development, during childbirth or during the newborn period and manifests itself in the form of various motor, mental and speech disorders.

There are reports in the literature about the state of the dental system in patients with DPC. These authors, when describing the state of the oral cavity and teeth in patients with cerebral palsy, focused their attention mainly on the study of dental caries, non-carious lesions of the hard tissues of the teeth, periodontal diseases and rightly pointed out the relationship between dental damage and the main CNS disease.

A more detailed survey in this area was conducted by B. B. Baizhanov. He studied children with cerebral palsy's harmful habits.

According to B. B. Baizhanov [1982], bad habits in children with cerebral palsy have their own specific features and a different pathogenesis, so it is more correct to call them stereotypical habitual reactions. The author divided the latter into three groups:

The first group of stereotypical habitual reactions – the habit of sucking (fixed motor reactions due to the lack of reduction of the sucking reflex) is most often observed in children suffering from atonic-astatic form of the disease [56.4%] and in patients with oligophrenia [51.2%], and in the latter it was characterized by a more intense manifestation, constancy or combination of different types of this habit in the same child. It was found that in patients

with cerebral palsy, the frequency of sucking habits is high [32.3%]. The reason for this can be considered brain damage, mental retardation of children and a high frequency of improper artificial feeding during the newborn period.

The second group of idiotypic habitual reactions - recorded pathological motor reactions of the peripheral articulation apparatus-was revealed to a significant extent and was expressed in speech articulation disorders [79.8%], incorrect swallowing [54.6%] and oral breathing. [48,5%]. Such disorders are often found in patients suffering from hyperkinetic, atonic – astatic form of cerebral palsy and having malocclusion. Disorders of the dentoalveolar system in patients with cerebral palsy are mainly caused by abnormal activity of the muscles involved in the act of swallowing, or were determined by coordination disorders of the respiratory muscles, diseases of the ENT organs, and other factors leading to oral breathing, incorrect swallowing, and unclear pronunciation of speech sounds. An important feature of them is the pathogenetic community among themselves and the combination of different types in the same child.

The third group of stereotypical habitual reactions-secondary incorrect position of the tongue and lower jaw was found in 37.6% of the total number of subjects. This form was especially characteristic for children with hyperkinetic cerebral palsy (46.1%). hyperkinesis of the peripheral articulatory system muscles was often a factor contributing to increased erasability of hard tooth tissues, lower bite height, lower jaw displacement, i.e. the establishment of incorrect habitual occlusion.

In patients with cerebral palsy, stereotypical habitual reactions have a specific pathogenesis and their own characteristics, which are based on the defeat of the Central nervous system with changes in neurodynamics, which creates a favorable background for fixing pathological conditional connections, i.e. bad habits. On the other hand, morphological abnormalities in the dental apparatus often found in these children also contribute to the emergence and consolidation of bad habits. Knowledge of these features is important for orthodontists, and overcoming them will increase the effectiveness of orthodontic treatment and speech therapy training for this contingent of children.

For patients with cerebral palsy, the most typical were malocclusions [72.3%], in particular, prognathic occlusion [51.5%] and anomalies in the position of the teeth [45.0%]. A connection was established between the types of dental anomalies, etiological factors of cerebral palsy and clinical manifestations of its individual forms. The most severe types of malocclusion were found in hyperkinetic and atonically astatic forms of cerebral palsy or in patients with mental retardation.

The clinical picture of dental anomalies in patients with cerebral palsy is characterized by a combination of their various types and stability, and they are aggravated with age. So in the period of permanent bite, the number of them reaches 92.5%. It can be assumed that self-regulation of dental anomalies in patients with cerebral palsy (especially in its severe forms) does not occur either in the first or in the second phase of the replacement bite. It is possible that this is also due to the presence of deformities resulting from defects in the teeth and dentition and a high frequency of untreated anomalies.

The study of diagnostic models of jaws allowed to reveal the structural features of prognathic malocclusion in patients with cerebral palsy. Analysis of the data obtained showed significant changes in the shape of the dentition in both the transversal and sagittal directions. The size of the sagittal fissure in the frontal area, more than 5 mm in size, was observed in 19.7% of all measured bite models. The most pronounced transversal measurements of dentition and their discrepancy in the sagittal direction were observed in the group of patients with mental retardation. Similar data were obtained when we examined 46 children with cerebral palsy in the Bukhara children's psychoneurological dispensary.

The functional state of the muscles involved in the act of swallowing also plays an important role in the occurrence of HFA. From birth to the eruption of baby teeth, children have an infantile type of swallowing. If the infantile type of swallowing persists even after the complete eruption of baby teeth, the tip of the child's tongue slips between the teeth with each swallowing movement and as a result, the function of the chin muscle begins to prevail, which is often observed in children with cerebral palsy until the end of their life. [1, 20, 30]. In addition, changes in the functional state of the masticatory and temporal muscles lead to an increase in the period of chewing and the number of chewing movements performed by the child.

We found that at rest there is an increased bioelectric activity of the masticatory and mimic muscles, and with motor manifestations (chewing and compression of the dentition) - a noticeable decrease in it.

A clinical dental examination was performed by E. A. Oleynik et al. in 76 children with cerebral palsy aged 7 to 15 years and 50 healthy children of the same age. Visual examination of the oral cavity revealed hyperemia, edema of the gingival mucosa, and bleeding in 51.31% of children. Based on the data of the proposed method of complex diagnostics of periodontal diseases, the prevalence of this type of dental pathology was 71.8 % in children aged 6 to 15 years. Of these, 3% of people were diagnosed with chronic generalized periodontitis of moderate to mild severity (concomitant disease-severe diabetes mellitus, hyperthyroidism). 26.9% of the examined children showed signs of hypertrophic gingivitis, and 63.4 % - catarrhal. In the control group, the incidence of gingivitis was 18% of people aged 12-15 years. Such high incidence was obtained after a full examination of the periodontium in children using the indices of RMA, Russell extended somatoscope. The Russell index was used to study the prevalence and intensity of periodontal tissue damage. The average value of the index in cerebral palsy was 0.7, in the group of organic CNS damage - 0.6, and in the control group - 0.5. In children with plastic diplegia, PI exceeded 1. The average RMA index in cerebral palsy was 31%, in CNS OP-29%, in the control group-24%. PMA greater than 30% was observed in 42 people [41.58%] . As is known from the literature, 70% of children with cerebral palsy have different oral breathing. Oral respiration leads to disruption of the activity of facial muscles, circular muscles of the mouth, tongue and to the

development of dental anomalies. Violations of myodynamic balance are observed between the buccal, masticatory, temporal and hyoid muscles. The myodynamic balance may be disturbed between the circular muscle of the mouth, the chin, and the muscles of the floor of the mouth. If the respiratory function is impaired, the activity of the circular mouth muscle increases several times compared to the norm, and its endurance is significantly reduced.

At the heart of the development of zchs abnormalities in patients suffering from cerebral palsy is a violation of reflex movement, the child can not control himself. There are complex movements and a vicious motor stereotype, coordination is broken, muscle tone is increased, and the abnormal development of HFA leads to bad habits.

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